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PROGRESS OF THE ARTS AND SCIENCES.

MECHANICAL INSTITUTIONS.

DURING the peace which the British dominions have been enjoying for several years, science and art, as might naturally be expected, have been advancing with no ordinary rapidity, particularly within the last three or four years. During this period, more has been done for the diffusion of practical science among the operative classes of the community, than has ever been done in any age or country. To effect this desirable end, associations, distinguished by the names of Mechanical Institutions, Schools of Arts, &c. have been formed in most of the principal towns of Britain; and courses of popular lectures, illustrated by experiments, and by the exhibition of models, have been delivered on the more useful parts of mechanics and chemistry.

Lectures, expressly adapted for those classes of the community, were first delivered in the Andersonian Institution of Glasgow, about twenty-five years ago; and in that establishment, such lectures have since continued to be given annually, and have been productive of great advantage to the manufactures of that important city. The next place in which any thing of this nature was done, was the Belfast Institution; in which, in 1814, lectures of a similar kind were delivered to the operatives of this place. Within the last two or three years, however, similar establishments have been formed in London, Edinburgh, Birmingham, Aberdeen, and several other places. During the last summer, also, the practice was revived in Belfast; two similar courses of lectures having been given in the Institution. We see, also, with great satisfaction, that meetings have been held in Dublin, and measures adopted, with every prospect of success, for establishing a similar association in the Irish capital.

The advantages of these establishments, provided, as they often are, with appropriate libraries and other helps, must be very great. From the opportunities which they afford, they must render the operative and manufacturing part of the population more intelligent, and more able, in their respective occupations; and they may often aid genius in the lower classes, in its struggles against the difficulties in which it may be placed, and contribute to give to the community the advantage of talents that might otherwise be lost in obscurity; and, in Ireland in particular, we hope to see them soon as generally established as circumstances will permit. With respect to Bel-

fast, the Institution furnishes what is requisite, so far as the instruction to be communicated is concerned; but we think that an association among the operative classes, for mutual improvement, and for the formation of a suitable library, and a collection of models and apparatus, in addition to what belongs to the Institution, might be of still farther advantage. Such a measure would diffuse a spirit of investigation, and a taste for reading, and would create a much greater desire of acquiring an accurate and extensive knowledge of what is useful in the various trades and occupations of artisans, than exists in this place at present.

THE STEAM ENGINE, STEAM VESSELS, AND STEAM GUNS.

THE steam engine continues to extend the sphere of its utility and of its wonders. In England alone, the power of steam is at present computed to perform the work of two millions of men. It is now employed, indeed, as a prime mover for the more powerful machinery of almost every kind; not only draining mines and grinding grain, but spinning and weaving cotton, and propelling vessels across the sea, contrary to wind and tide; with other applications too numerous to recount. In its application to vessels, indeed, it has rendered man independent of the winds and waves, in a degree which the most sanguine mind, even a few years back, could never have anticipated. It has given a degree of certainty and regularity to travelling and to correspondence by sea, that is but little inferior to what is attained by land. The great importance of this application of the power of steam, is now beginning every day to be more generally felt; and we find, accordingly, that steam vessels* are now plying between various parts of Ireland and Britain; and also between the ports of Britain, and those of France, Spain, and Holland. They are also beginning to be employed much more generally on rivers, canals, and lakes; and, to complete the wonder, a project is now in progress to establish a connexion, by steam navigation, between England and India.

A power of such national importance naturally induces men of talents to endeavour to make improvements in the mode

* The number of steam vessels belonging to Great Britain and Ireland, is at present nearly 200, of which about 40 are on the Clyde. The steam vessels belonging to the United States, in 1823, were estimated at 300.

of its application; especially, as it is universally admitted, that certain improvements would be desirable, if they could be effected. We find, accordingly, that numerous attempts of this nature have been made from time to time. Of these, none have attracted so much notice as those of Mr. Perkins, of London; who, by heating water in a strong cylinder, far beyond the boiling point, produces a power vastly greater than that obtained by the common means—a power, indeed, of seven or eight hundred, or a thousand pounds on each square inch, instead of eight or ten pounds, the pressure generally employed. By this means, he calculates on producing effects, which must astonish, even in this age of mechanical wonders. One of the most remarkable of these, is its proposed application, instead of gunpowder, in propelling balls. This application of it, which is said to be at present under the consideration of the British Government, is represented as likely to make an entire change in the present system of war; as one gun, by means of this extraordinary power, would discharge as many balls as fifty or a hundred in the present way, and with a destructive force immensely greater. We are gravely told, indeed, that an army, provided with three or four such portable guns, might sacrifice one or two hundred thousand of their enemies in a day; and thus, perhaps, to the soothing of our feelings of humanity, a peace might be brought about in a few weeks, from the inability of the parties to continue the war. With respect to pretensions so wonderful, it is natural to suspend our judgment, till we have more decisive evidence; and we may reasonably suppose, that there is considerable exaggeration in the accounts thus far laid before the public. It must be admitted, however, that Perkins is no ordinary man; and we can scarcely think, that no important results will arise from the great attention which he has paid to the steam engine.

Among the attempts to improve the steam engine, we may mention that of our ingenious townsman, Mr. Rider, who has endeavoured to supply what has long been felt as a desideratum—the production of a rotatory motion directly, without the intervention of a crank, and the loss of power thus occasioned. In this, he has succeeded in principle, and has also greatly reduced the inconvenient size of the engine; and produced, we are informed, a great saving of fuel. We are aware, that objections of a practical nature have been urged against this engine; but with what justice, we cannot say. We trust, however, they are not well founded.

TEMPERATURE.

FROM a paper published by M. Arago, in the *Almanac* of the Board of Longitude of

Paris, for 1825, it appears that of the extreme instances of cold experienced at Paris since 1665, eight happened in January, three in December, and one in February; and that, of the extreme instances of heat since 1705, six happened in July and four in August. The greatest degree of cold during the former period was on the 25th of January, 1795, when the thermometer indicated $23^{\circ} \cdot 5$ (centigrade) below zero, or $42^{\circ} \cdot 3$ below the freezing point on Fahrenheit; and the greatest degree of heat during the latter period was on the 8th of July 1793, when the thermometer, in the shade, in a Northern aspect, and as much as possible out of the influence of the reverberations of the ground, stood at $38^{\circ} \cdot 4$, centigrade, or $101^{\circ} \cdot 12$, Fahr. From the same paper, it appears, that at Paris there were twenty-five days of successive frost, in 1776; sixty-nine, in 1783, forty-two in 1795, and thirty-two in 1798. It appears also, from the observations of Captain Parry, that at *Melville Island*, there are, in the year five months during which mercury freezes in the open air,—an extreme degree of cold; as the freezing point of mercury is 71° of Fahrenheit below the freezing point of water.

Z. A.

HORTICULTURAL SOCIETY IN BELFAST.

WE have heard that it is in contemplation to form a HORTICULTURAL SOCIETY in Belfast, to include several of the Northern Counties. Such Societies, wherever formed, have received the countenance of the principal Nobility and Gentry, and we cannot entertain a doubt, that a Northern one would experience similar patronage. A taste for Gardening deserves encouragement; and the rewards given by such a Society, whilst they require no great exertion on the part of the subscribers, serve to stimulate the exertions of the working gardener. Another object has been also mentioned, that of establishing a library for working gardeners, which they may have the privilege of consulting. There is no art, the works illustrative of which are more expensive than those which have been published on Gardening; so much so, that no person in a middle station of life, can afford to purchase them. Such a library will have many advantages, and would be no small recommendation of the plan, to which we heartily wish success. It is favourable to exertion, that in the neighbourhood of Belfast there resides a gentleman who has tried many valuable experiments in the naturalization of foreign plants, and who is so well known, both as a successful cultivator, and as a scientific botanist throughout the United Kingdom, that should he be induced to engage in promoting this measure, it would contribute much to an intercourse with other Societies, having the same object.